

formed. The cam surface 39c3 at the higher position serves to allow the disk recording/reproducing unit 10 to be in a recordable/reproducible state, and the cam surface 39c1 at the lower position serves to allow the disk table 5 to be in a rotatable state in a clockwise or counterclockwise direction.

The second cam surface 39d and the third cam surface 39e are cams for detecting the cam mode. The state of this cam mode is as shown in FIGS. 8(c) and 8(d) in correspondence with FIG. 8(a). The above-mentioned cam surface 39d is formed on the upper surface of the cam wheel 39. On the other hand, the cam surface 39e is formed on the internal surface side of the cam wheel 39. Switch levers 48 and 49 in contact with the cam mode detectors (hereinafter referred to as switches 46 and 47) shown in FIG. 3 are slidably in contact with the cam surfaces 39d and 39e, respectively. The cam mode is detected by the switches 46 and 47 to control the motor 35 (FIG. 3) serving as a drive source by control means (not shown). In place of the switch 46 or 47, a photo sensor, etc. may be used.

The fourth cam surface 39f serves as a cam to securely fix the disk table 5 before the disk recording/reproducing unit 10 is raised in the loading operation which will be described later. Accordingly, the disks table 5 is securely fixed in the recordable/reproducible state by the action of the fourth cam surface 39f. This cam surface 39f is formed on the internal surface side of the cam wheel 39. The lock lever 50 (FIG. 3) is slidably in contact with the cam surface 39f. The state of this cam mode is as shown in FIG. 8(e) in correspondence with FIG. 8(a).

Operation of the loading mechanism 30

The operation of the loading mechanism unit 30 will now be described with reference to FIG. 3, 4, 6 and 9 to 11.

A plurality of disks 4 are mounted in advance on the disk table 5 within the disk drive 1. Respective components in the disk drive 1 are set so that they take an initial position shown in FIG. 9A.

Namely, at the initial position shown in FIG. 9A, the idler 41 of the loading mechanism unit 30 is away from the inner tooth gear portion 5 of the disk table 5, the planetary gear 38 integrated with the idler 41 is meshed with the toothed gear portion 31a3 of the ring 31a near the toothless portion 31a2, and the disk recording/reproducing unit 10 is in a fallen state. Accordingly, the projecting pin 11c of the disk recording/reproducing unit 10 is placed at the position of the lower cam surface 39c1 of the cam wheel 39.

From the above-mentioned initial state, the operation of the loading mechanism 30 shifts to the disk selecting operation. In the mode of the disk selecting operation, as previously described, the direction of rotation of the disk table 5 is selected so that the disk 4 reaches the recording/reproducing position PR1 (FIG. 2) in the shortest time. The operation in the case of rotating, e.g., the disk table 5 in a clockwise direction to move a desired disk 4 up to the recording/reproducing position PR1 is described below.

Namely, the motor 35 is rotated so as to rotate the idler 41 from the initial state in a clockwise direction, as shown in FIG. 9B. At this time, since the planetary gear 38 in one body with the idler 41 is meshed with the toothed gear portion 31a3 of the ring 31a, it revolves the cam wheel therearound in a counterclockwise di-

rection while revolving on its axis in a clockwise direction.

When the planetary gear 38 is passed through the toothed portion 31a3 of the ring 31a to enter the toothless portion 31a2 of the ring 31a, the planetary gear 38 in one body with the idler 41 stops revolution on its axis by the weight of the friction member 42 of the clutch section 40 and the compression spring 44. As a result, the cam wheel 39 only revolves round in a counterclockwise direction. Thus, the idler 41 comes into contact with the inner tooth gear portion 5a of the disk table 5, as shown in FIG. 9C. It is to be noted that, as previously described, the projecting pin 11c of the disk recording/reproducing unit 10 is not directly in contact with the lower cam surface 39c1, but there is a gap of about 1 mm (FIG. 4A). Accordingly, in allowing the idler 41 to come into contact with the inner tooth gear portion 5a of the disk table 5, load of the disk recording/reproducing unit 10 is not applied to the cam wheel 39. Thus, the cam wheel 39 can lightly revolve round in a counterclockwise direction.

When the idler 41 comes into contact with the inner tooth gear portion 5a of the disk table 5, revolution in a counterclockwise direction of the cam wheel 39 is stopped, as shown in FIG. 9D. Since the torque of the motor 35 is stronger than the friction force of the clutch portion 40, the planetary gear 38 in one body with the idler 41 begins rotating in a clockwise direction. At this time, since a force of rotation is exerted on the cam wheel 39 in a counterclockwise direction at all times by the friction force of the friction member 42 of the clutch section 40 and the compressive force of the compression spring 44, the disk table 5 rotates in a clockwise direction without slip. Thus, a desired disk 4 reaches the recording/reproducing position PR1.

Here, after it is confirmed that the desired disk 4 has reached the recording/reproducing position PR1 by means (not shown), the motor 35 is rotated so that the idler 41 rotates in turn in a counterclockwise direction, as shown in FIG. 9E. When the idler 41 rotates in a counterclockwise direction, the idler 41 escapes from the inner tooth gear portion 51a, and is away therefrom. At this time, the cam wheel 39 rotates in a clockwise direction, so the planetary gear 38 in one body with the idler 41 moves from the position of the toothless portion 31a2 to mesh with the toothed gear portion 31a3, as shown in FIG. 9F. In this state, the disk recording/reproducing unit 10 is still being fallen, and the lock lever 50 slidably in contact with the cam surface 39f/locks the disk table 5. Namely, as shown at the light and lower part of FIG. 10, a lever 52 rotating about a shaft 51 is connected to the end portion opposite to the side slidably in contact with the cam surface 39f of the lock lever 50. One end of this lever 52 comes into contact with the inner tooth gear portion 5a of the disk table 5 as shown. As a result, the disk table 5 is locked.

Further, as shown in FIGS. 9G and 11, when the idler 41 continues to rotate in a counterclockwise direction, the planetary gear 38 in one body with the idler 41 revolves round along the toothed gear 31a3 while revolving on its axis. Moreover, since the cam wheel 39 also rotates in a clockwise direction, the projecting pin 11c of the disk recording/reproducing unit 10 is passed through the tapered cam surface 39c2 from the cam surface 39c1 at the low position, and slidably moves up to the position of the higher cam surface 39c3, as shown in FIGS. 4B and 9H.